REMARKS

This Amendment responds to the Office Action dated November 5, 2003 in which the Examiner stated that claims 1-2, 4-7, 35 and 54-59 are allowed, objected to claims 67-69 and 71-73 as being dependent upon a rejected base claim but would be allowable if rewritten in independent form, rejected claims 60-61 under 35 U.S.C. §102(b) and rejected claims 62-66 and 70 under 35 U.S.C. § 103.

Concurrently filed with this Amendment is an Information Disclosure Statement citing references cited in a corresponding Japanese examination report. Applicants respectfully request the Examiner consider the references.

As indicated above, claim 62 has been incorporated into claim 60, along with additional features. The Amendment is unrelated to a statutory requirement for patentability. Additionally, claim 63 has been amended for dependency, claims 67 and 68 have been amended to correspond to amended claim 60 and claims 71-73 have been amended for a typographical error. The amendments to claims 63, 67, 68 and 71-73 are unrelated to a statutory requirement for patentability and do not narrow the literal scope of the claims.

Claim 60 claims a thermoplastic resin injection molding machine comprising a plasticating unit, an injecting unit, a buffering unit, a screw, a position detecting sensor and a controller. The plasticating unit is for plasticating a thermoplastic resin. The injecting unit is connected to the plasticating unit through a connecting passage to inject the plasticated resin into a mold. The buffering unit has a buffering chamber and receives the resin plasticated in the plasticating unit. The buffering unit is contained in the plasticating unit and is located in a longitudinal direction of the plasticating unit. The screw is contained in the plasticating unit. The position

detecting sensor detects a change in position of the screw. The controller calculates an amount of resin in the buffering chamber based on the position of the screw and controls the screw.

Through the structure of the claimed invention having a controller which calculates an amount of resin in the buffering chamber based on the position of the screw and controls the screw as claimed in claim 60, the claimed invention provides a thermoplastic resin injection molding machine which can be reduced in size. The prior art does not show, teach or suggest the invention as claimed in claim 60.

Claims 60-61 were rejected under 35 U.S.C. § 102(b) as being anticipated by *Baigent* (U.S. Patent No. 3,080,610). In addition, claims 62-63, 65 and 70 were rejected under 35 U.S.C. §103 as being unpatentable over *Baigent* in view of *Yabushita* (U.S. Patent No. 5,389,315).

Baigent appears to disclose a machine in which the thermoplastic material, instead of being injected direct from the preplasticising injection chamber into the mould is injected from said preplasticising chamber into the transfer injection chamber from which the material is then injected into the mould. (col. 1, lines 65-71) The transfer unit proper comprises a transfer cylinder or chamber 10 surrounded over the major portion of its length by heating elements 11 for keeping the thermoplastic material at the desired degree of plasticity prior to being injected into the mould. At the upper end the transfer chamber or cylinder is provided with an injection opening or orifice 10a adapted to register in sealing engagement with the inlet orifice 22 of a mould 23. Near the lower end of the transfer chamber or cylinder is a lateral inlet orifice 12 through which the thermoplastic material is injected into said transfer chamber 10 from the preplasticising chamber 3 of the preplasticising

unit. The inlet orifice 12 of the transfer chamber or cylinder 10 is connected with the injection nozzle 3a of the preplasticising chamber 3 by an intermediate extension conduit 13 which is surrounded throughout its length by suitable heating elements 14. This intermediate extension conduit 13 is connected with the nozzle 3a of the preplasticising chamber and with the inlet orifice 12 of the transfer chamber or cylinder 10 by ball and socket type connections, that is said conduit 13 is provided at its ends with spherical portions which register with corresponding spherical seatings in the wall of the transfer chamber or cylinder 10 and the injection nozzle 3a. By this means any relative vertical displacement of the transfer unit and the preplasticising unit will not result in damage or fracture of the extension conduit 13 or affect its function and will prevent any stresses from being transferred to the preplasticising unit or the transfer unit. (col. 2, lines 42-71, emphasis added) Hydraulic pressure from pump P2 is then directed through ports P and A of valve V3 and ports P and B of valve V4 to hydraulic motor HM, which operates to start the refill period of the plasticising chamber and when the plasticating chamber is fully recharged the rearward movement of the plunger screw 5 operates limit switch LS2 to de-energize solenoid B of valve V4. Pump P2 then delivers to tank through ports P and T of valve V4. (col. 3, line 71 through col. 4, line 3) The plasticating screws 5 are thus moved forward to start the injection of the contents of the preplasticising chamber 3 into cavity 10 of the transfer cylinder. When this injection is completed the timer T3 ends its timed period so that its normally closed contacts open to de-energise solenoid A of valve V4 and pump P2 delivers to tank. (col. 4, lines 30-36)

Thus, *Baigent* merely discloses an injection molding machine. Nothing in *Baigent* shows, teaches or suggests a controller calculating an amount of resin in a

buffering chamber based on a position of a screw and controlling a screw as claimed in claim 60. Rather, *Baigent* merely discloses an injection molding machine including a mold, a transfer unit, a pre-plasticising unit and a heating element.

Yabushita appears to disclose the injection molding machine 30 comprises a hopper 31 for supplying resin material in the form of pellets to the machine main boy, a nozzle 32 connected to the lower die 10 for supplying molten resin thereto, and an in-line screw 33 provided inside the main body for pushing the molten resin material out to the nozzle 32 by a prescribed amount with its forward feed motion. The amount of the resin material supplied to each of the valve gates 13 is controlled according to the displacement of the in-line screw 33 in view of the fact that the position of the in-line screw 33 can be accurately detected. More specifically, a positional sensor 34 is installed in such a manner that the position of the in-line screw 33 can be accurately detected, and an output signal from this positional sensor 34 is supplied to a CPU 40 which in turn issues command to each of the three valve gates 13a, 13b and 13c illustrated in FIG. 3 to open and close them in a sequential manner. (col. 4, lines 39-58) Fig. 5 shows the provision of metering means 15 for metering and supplying a prescribed amount of molten resin to each of the gates 14 branching off from the hot runner 12. As illustrated in Fig. 5, the metering means 15 is provided in the corresponding gate 14, and a prescribed amount of molten resin metered by the metering means 15 is distributed to the die surface of the lower die 10 from the gates 14 via a three-way rotary valve 16. The structure of this metering means 15 comprises a metering chamber 151 communicating with the hot runner 12, and a plunger 153 connected to the hydraulic cylinder 152 is received in this metering chamber 151. A sensor 154 is provided in

such a manner as to detect the position of this plunger 153, and by receiving a signal from the position sensor 154 the CPU 40 issues a command to the solenoid valve 155 to actuate the hydraulic cylinder 152 and open and close the rotary valve 16. More specifically, the resin material which is supplied into the hot runner 12 from the nozzle 32 of the injection molding machine 30 is filled into the metering chamber 151 via the rotary valve 16, as the plunger 153 receded to the left as shown in the drawing. When the plunger 153 has receded to a prescribed position, the rotary valve 16 is closed as the position sensor 154 detects the position of the plunger 153, and send a signal to this effect to the CPU 40. The CPU 40 then moves the plunger 153 to the right by opening the solenoid valve 155 and actuating the hydraulic cylinder 152, and communicates the metering chamber 151 with the gate 14 by opening the rotary valve 16 so that the resin material metered by the metering chamber 151 may be distributed to the die surface of the lower die 10 via the gate 14. Thus, by provision of the metering means in which a plunger 153 is provided for each of the gates 14, and the volume of the resin material to be injected is metered by the stroke of the plunger 153, the metering at each of the gates can be accomplished in a highly accurate manner. (col. 5, lines 26-68)

Thus, *Yabushita* merely discloses a sensor 154 which detects a position of a plunger 153 and sends the signal to a CPU 40 which then issues a command to open or close a rotary valve 16. Furthermore, when the plunger 153 has receded to a prescribed position, the rotary valve is closed, which is detected by the position sensor 154 and sent to the CPU 40 which then moves the plunger to the right (column 5, lines 43-62). In other words, *Yabushita* merely discloses a CPU which checks the position of a plunger and sends a signal to a valve in order to open or

close the rotary valve. Nothing in *Yabushita* shows, teaches or suggests a) a controller calculating an amount of resin in a buffering chamber based on a position of a screw and b) a controller controlling the screw as claimed in claim 60. Rather, *Yabushita* merely discloses a CPU which controls the opening and closing of a rotary valve 16 and controls the movement of a plunger 153.

The combination of *Baigent* and *Yabushita* would merely suggest to include the CPU of *Yabushita* in the device of *Baigent*. Therefore, nothing in the combination of *Baigent* and *Yabushita* shows, teaches or suggests a controller calculating an amount of resin in a buffering chamber based on a position of a screw and a controller controlling a screw as claimed in claim 60. Therefore, applicants respectfully request the Examiner withdraws the rejection to claims 60-61 under 35 U.S.C. §102(b) and withdraws the rejection to claims 62-63, 65 and 70 under 35 U.S.C. §103.

Claims 64 and 66 were rejected under 35 U.S.C. §103 as being unpatentable over *Baigent* modified by *Yabushita* and further in view of *Cheng* (U.S. Patent No. 5,098,267).

Applicants respectfully traverse the Examiner's rejection of the claims under 35 U.S.C. §103. The claims have been reviewed in light of the Office Action, and for reasons which will be set forth below, applicants respectfully request the Examiner withdraws the rejection to the claims and allows the claims to issue.

As discussed above, since nothing in the combination of *Baigent* and *Yabushita* shows, teaches or suggests the primary features as claimed in claim 60, applicants respectfully submit that the combination of the primary references with the secondary reference to *Cheng* will not overcome the deficiencies of the primary

references. Therefore, applicants respectfully request the Examiner withdraws the rejection to claims 64 and 66 under 35 U.S.C. §103.

Since objected to claims 67-69 and 71-73 depend from allowable claims, applicants respectfully request the Examiner withdraws the objection thereto.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested.

If for any reason the Examiner feels that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, applicants respectfully petition for an appropriate extension of time. The fees for such extension of time may be charged to Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

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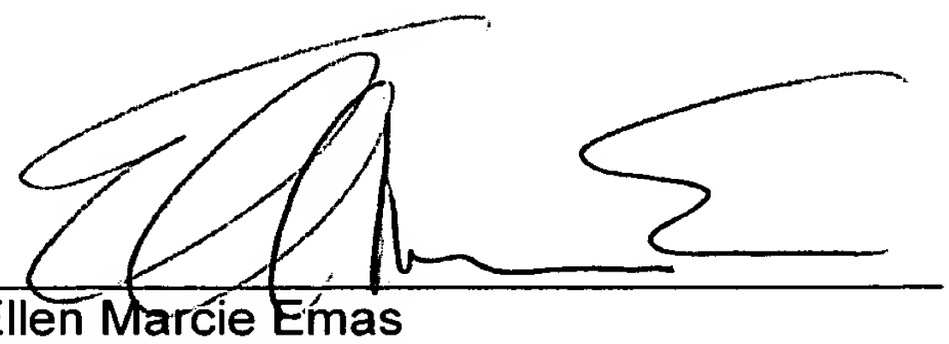
By: 

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